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Review Paper

Evolution and methodology of Japanese machizukuri for the improvement of living environments

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Abstract

Machizukuri emerged as a way for residents to solve local community problems autonomously and, throughout the past half century, it has experienced a unique development process. This paper describes its history, the various methods accumulated through continuous practice, and its achievements and prospects, as follows. Section 1 presents the context in which Japanese machizukuri was born. Even though similar trends appeared all over the world in response to the turbulent social context in the latter half of the 1960s, unique conditions in Japan gave way to a specific approach, which is today called machizukuri. Section 2 presents its evolutive process, from the birth of machizukuri until the present. Studying the development of particular systems, methods, designs, and planning techniques over time, three generations can be identified. Section 9 addresses the research and practical development of machizukuri as developed by the author of this paper. Finally, Section 15 describes and summarizes the future prospects and challenges of machizukuri.

Keywords
community involvement, design game and simulation, improvement of living environment, Machizukuri

1. Introduction

"Machizukuri" was born in Japan in the latter half of the 1960s as a way for local communities to actively engage in the improvement of their living environments.[1]

Today, machizukuri has evolved and defined itself gradually by integrating various practices. The author of this paper witnessed the birth of machizukuri during his school days and has since consistently been involved with machizukuri research and practice. Within the wide range of fields encompassed by machizukuri, this paper presents the historical development of one of its most widespread branches concerned with the improvement of living environments. Here, while conducting/providing a retrospective review of personal research and experiences, the systems, techniques, and methods developed in this field will be discussed [Note 1].

2. Background of machizukuri

2.1 The sociopolitical base of machizukuri

In the late 1960s and the beginning of the 1970s, Japanese machizukuri brought together the various activities that took place in different contexts in order to face the threats posed to living environments. In the midst of many anti-establishment protest movements and riots that emerged simultaneously all around the world in the 1960s, machizukuri was born as an ideal philosophy grounded on local discussions about the improvement of the built environment, lifestyles, and the local community. Influenced by the widespread critical attitude and assisted by a period of high economic growth in Japan, this social movement asked for more participation, independence in the decision-making process, and the establishment of a true democracy that gave voice to the whole scope of the Japanese population. This meant including the opinions of regular citizens who had not been listened to by preceding governments.

Since then, for half a century, various trial and error experiences have followed, involving diverse organizations, people, governmental bodies, and the private sector in planning and community building.[1] In other words, Japanese machizukuri was built up gradually as an accumulation of unnamed experiences [Note 2] and defined itself as the act of sharing practices in every situation, in an attempt to integrate the design of communities with the design of the physical and built environments. During the last decades, the enrichment of machizukuri through on-site practice has positioned it at the core of modern urban planning and community building.

The term "machizukuri" encompasses an ensemble of approaches and activities based on the resources existing in

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each local society, carried out by diverse actors in order to improve the quality of life and surrounding living environments. Therefore, we should first acknowledge that machizukuri is an inclusive general concept that portrays an attitude toward community planning and empowerment. As mentioned above, the birth of machizukuri can be found in the late 1960s, when local residents, experts, and city governments began to promote decentralization and participation in decisions related to urban management. We can thus say that it was born as a bottom-up planning concept which aimed especially at the improvement of living environments. Initially, machizukuri appeared as a theoretical concept, a social ideal that later had to go through an experimental phase of trial and error in order to evolve into effective on-site practice. These trial and error attempts to work with local communities led to the definition of clearer action strategies that concerned local citizens and required their special participation.

2.2 The meaning of the term "machizukuri"

The Japanese language uses the word "*machi*," which could be translated as "town." However, the term bears a vivid and distinctive character. Machi portrays the physical environment in which social activities take place and, in this way, the concept defines not only the material structure of the town, but the place where the intangible aspects of local communities and the physical environment combine.

The tri-syllable "*-zukuri*" in the expression "Machi-zukuri" means "to make." It does not simply mean to make inanimate things; rather, it means, connotatively, to cultivate things with full effort, heart, and soul while participating in the lengthy process of making and animating them. Accordingly, the full term "machizukuri" signifies the making and management of a town with care and respect. Aside from giving heed to the town's physical environment, machizukuri genuinely takes the social context into account in its roots and origins. Tradition, cultural elements, industrial structures, and education, or breeding, are considered. Thus, machizukuri embraces a lengthy process at the pace of the local community in which the community strengthens and rebuilds itself. As explained above, "zukuri" does not mean to create new things, but to enhance them without sacrificing their original essence. Accordingly, the so-called machizukuri also embodies such a process. It means to upgrade a place, little by little, by applying a set of schemes for local cultivation.

This author, while searching for the proper English words to translate the term, could hardly compose a suitable expression equivalent in meaning to machizukuri. There are certainly expressions in English such as "community development," "community design," or even "community improvement," and yet, their perspectives are narrow and their meanings are limited. It is not uncommon, however, for the Japanese language and linguistics to refer to a whole sophisticated idea by creating an inexplicit and vague expression.[2]

All along the machizukuri process, administration officials, hand in hand with experts, work through the quest of synthetically upgrading the living environments of the local community; on the other hand, the community comes to play a subjective role. Today, we can defend that such synthetic activities that include local inhabitants are becoming inevitable in the field of contemporary city planning. In this context, the intention of machizukuri can be apparent and convincing as long as the people and the different organizations existing in the community show a willingness to cooperate and work hand in hand, despite the prospect of a lengthy process.

2.3 Opportunities for the exercise of machizukuri

In the latter half of the 1960s, aiming at improving living environments, machizukuri was born as an anti-establishment movement [Note 3] that challenged the three main issues described below.

2.3.1 Anti-*kougai* movement

First, the origins of machizukuri can be traced back to the resistance movements that appeared against the public nuisance caused by public environmental pollution. The misuse and neglect brought about by a period of high economic growth in the 1960s caused serious pollution problems in several areas. In Japanese, "*kougai*" can be translated into public nuisance and environmental pollution. However, the concept also involves the mental, physical, and economic damage caused to local residents and the general public by the destruction of nature and the living environments that accompany harmful business and human activities. Officially, under the Japanese "Basic Environment Law" [Note 4] (1993), the term refers to air pollution, water pollution, soil pollution, noise, vibration, ground subsidence, odor, and so forth. However, there are other possible implications such as food pollution, the destruction of living environments, or the scarcity of sunlight caused by high-rise buildings. These issues can equally be considered as "*kougai*."

Under diverse circumstances, resistance campaigns against pollution in residential areas made the turn toward creative machizukuri, actively working on environmental improvements based on their own community initiatives[3,4]; these streams of community movements were in fact directly linked with the residents' movements and campaigns against *kougai*. In this context, the specific activities that were born in Kobe City, Hyogo Prefecture, are especially significant. The community movement in Japan first broke out in the Maruyama district of Kobe city. In the Rokkou Mountain area, land reclamation activities caused an unceasing downhill flow of trucks carrying excavated soil to the foothills of Maruyama, resulting in unbearable traffic and pollution for the local residents. In response, locals took action. They started publishing and distributing their own local newspaper, and the establishment of their own community councils soon followed. With this, the former protest movements started materializing into creative, positive, and significant local resident machizukuri movements, which were also in charge of the running and maintenance of public facilities such as playgrounds, kindergartens, and nursing rooms for youngsters.

This constitutes a clear example on how protest movements switched to machizukuri.

On the other hand, in the lower Mano district of Kobe city, for the traditional lower town "*shita-machi*," the small wooden terraced-houses were mixed with small-scaled factories creating a very dense urban fabric, which was sarcastically called a "pollution department store." This context pushed forward the development of residents' movements under the direction of an outstanding leader, the chairperson of the community association, who appealed for environmental protection from air pollution created by nearby factories that was affecting the residential condition.

Activities began in 1965 to improve the living environment of the district, gradually leading to the establishment of a

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"grassroots democracy" in the sense of local autonomous management groups and systems. Various activities were repeated consecutively and, by 1978, the "Mano district machizukuri discussion meeting" was established. It gathered community group leaders from various fields within the district (such as senior citizen, women, youth, or children's associations) in cooperation with experts, the city administration, and especially architects, thus unifying under a single platform the various existing working groups in the area. From this point, the group created a "Machizukuri plan" to envision the future of the district, which worked as an official proposal that was presented to the government. Thereafter, in 1980, the residents' "council" and "union" [Note 5] rallied various organizations, providing the bases to later establish the "Mano Machizukuri Promotion Council" from the union of movements appealing for environmental revitalization.

However, at the time, there was no pre-established procedure for the government to materialize and implement these plans. Consequently, such bottom-up ideas had no direct impact or link to governmental plans. Following these ongoing actions and according to the new legal needs, in 1980, Kobe City created the so-called "Machizukuri Ordinance," which became a certification body for the proposed plans. It helped to promote the development of actions proposed in the Machizukuri Plan, such as small parks, small-scale redevelopment initiatives, the construction of daycare-leisure centers, and so forth.

Through the process described above, the district overcame the damage caused by the Great Hanshin-Awaji Earthquake and subsequently became a reference for Japanese machizukuri.

2.3.2 Improvements in neglected high-density built-up wooden areas as an anti-disaster solution

Next, another situation that required the development of related machizukuri activities is that of the traditional built-up density in Japanese cities. The majority of urban areas in Japan consisted of wooden buildings, especially in poor urban contexts where old houses are concentrated along narrow labyrinthic alleys. In such districts, in the event of a large earthquake, the risk of fire and the consequent rapid propagation is considerably high. As a consequence, aware of the dangers of these residential areas, disaster prevention actions that address the improvement of such complex urban tissue were also urgent priorities for the local residents.

The "Kawasumi sixty-nine period theory"[5] defends the notion that there is a specific period of time in which the probability that the cyclic Kanto Earthquake will strike Tokyo again is higher. Taking this into account (according to calculations), in the latter half of the 1960s, the improvement of the disaster prevention performance of the lower city's high-density built-up wooden areas that spread in the eastern part of Tokyo seemed to be an urgent task. At the beginning of the 1970s, the construction of the Koto Earthquake disaster prevention base was carried out in place of a vast redevelopment project. However, it was difficult to completely reconstruct the densely built-up wooden urban areas through urban redevelopment and land readjustment projects. Moreover, local residents did not want their familiar social and physical environment to be replaced by large-scale public projects, and instead wished to improve the areas while maintaining the existing community. In other words, here, disaster prevention measures had to be tackled through novel forms of machizukuri. As a result, the Kyoujima District, in the Sumida Ward of Tokyo, was designated as a trial action area by the Ministry of Construction and was used as a model project for improving other problematic densely built-up wooden environments.[6]

These kinds of projects require that residents take action on their own initiative to develop such ideas. The administration and local community must work together, with the assistance of experts, and seek suitable methods of machizukuri to gradually improve the living environment. These dense urban areas are not only located in Tokyo, but also in other large Japanese cities, and even in medium and small cities. In this context, machizukuri was able to assist each community to improve their living areas on their own initiative, such as what happened in the Mano District described above and in various other places that will be presented later in this paper.

2.3.3 Alternative methods to a weak city planning system

Third, another important issue that propelled the development of machizukuri was the weakness and inadequacy of the Japanese regulations that should have preserved the living environments at the time. Traditional Western European urban planning models, some as iconic as those used in the UK and Germany, use detailed regulatory systems and planning restrictions that materialize into clear master and detailed plans, from land use to architectural design depending on the scale of each project. However, in the Japanese context, these tools were neither sufficiently versatile nor effective for cases in which the aim was to maintain the sociocultural implications of living environments.

On the other hand, Japanese planning models are more project-oriented. Japanese city planning (*Toshi Keikaku* in Japanese)[7] focuses on specific development projects, such as the construction of public facilities, streets, or land readjustments involving the re-arrangement of plots. Moreover, Japanese planning presents other singularities. For example, in principle, Japanese land use plans permit the coexistence of mixed uses, building type regulations do not prevail over the rights of the land owner, there are no restrictions on the division of residential lots, and loose regulations also do not hinder development. All these particularities underline the weak power of Japanese planning control.

Especially after 1969, when the "Absolute Height Limit" of the allowed constructions inside a block was eliminated, high-rise buildings developed in great contrast to the existing environment in various places throughout Japan. This became a serious nuisance to the living environment to the extent that the term "*kougai*" was retaken and "*building kougai*" was coined, putting high-rise buildings on the same level with other types of pollution. This made it clear that urban planning and building regulations were ineffective, and residents, with the support of experts, had to stand up for the conservation of living and historical environments.[8] In this context, the machizukuri movement appeared as a complementary strategy that rapidly achieved great importance.

Among the many opposition movements to new developments, the movement of Karasuyama Teramachi district is a representative case of the evolution of the machizukuri practice that was born as a movement opposed to harmful development.[9] As a result of the process, the existent rich greenery in the area and the living environment was almost completely preserved. In the early 1970s, a religious organization came up with a sudden plan to rebuild a large temple complex in the district. In this case, if only urban planning regulations had been applied, the local environment would have been destroyed by the project. In addition, regulations

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were ineffective against the proposed construction plans, which would have blocked solar access in neighboring residential areas. Through counteraction of residents' organizations, supported by theoretical claims by experts, tenacious negotiations took place and opposition groups succeeded in reclaiming the reduction of the height and the scale of the construction project. The movement then proceeded to develop activities aiming at the conservation of the living environments in general, leading to the creation of a "machizukuri charter."

Another reference example is that of the Fushimi district in Kyoto. Here, the construction of traditional town houses had continued until modern times. Unexpectedly, a proposal to build a high-rise block of apartments was made, triggering an intense local opposition campaign in reaction. However, the loose regulations did not limit such projects, which could be accepted by law. Thus, the opposition party lost its claim in court. Nevertheless, as a consequence, a machizukuri movement supporting the conservation of the traditional evolving townscape was born.

Thus, we can conclude that whenever urban planning systems could not assist with the improvement and conservation of calm living environments, the cooperation of residents, experts, and municipalities produced alternative methods to address these delicate dimensions of the urban environment. This is what we now call machizukuri.

3. The birth of machizukuri and its three generations[5,10]

The evolutionary process of machizukuri can be divided into three periods:

- The first generation corresponds with the development and perfection of a philosophy of machizukuri in the late 1960s and early 1970s.
- In the second phase, experimentation and model making through community participation are at the core. During this second generation, from the mid-1980s, experimental cases helped to generate new action models.
- Finally, since the late 1990s, the third generation of machizukuri focuses on area and community management. The accumulation of trial and error experiences in the previous two decades gave shape to contemporary machizukuri.

3.1 The first generation of machizukuri

The previously presented examples of machizukuri for the improvement of living environments, the Mano district in Kobe, and the Kyojima district in Tokyo, became icons of the first generation of machizukuri. Trying to replicate them, machizukuri was likewise born in other districts.

During this period, along with the establishment of clear principles for machizukuri, new methods were developed. In this first phase, the ideas for the improvement of the living environment were typically implemented by means of five different tools: (i) the establishment of a "Machizukuri Council" through the direct participation of residents; (ii) the processing of district "Machizukuri Plans" [Note 6]; (iii) the use of "Machizukuri Ordinances" by local governments; (iv) the development of methods for the improvement of poorly prepared residential districts and assistance to housing reconstruction, stage by stage, with the help of a district plan; and (v) the amendment of the country's legal system by the Ministry of Construction to officially integrate and assist with the innovative methods listed above.

First, Machizukuri Councils had to be formed. In order to democratically continue with the process of machizukuri, a legitimate representative organization was needed. With the support of this organization, the district Machizukuri Plan was drawn and recognized as a legitimate vision by the community. The name "Machizukuri Council" [Note 7] was normally used when a community group gathered with the purpose of developing a specific machizukuri project. On the other hand, for cases targeting, for example, the general environmental improvement of a whole district, other names were used instead (for example, "*Chiku*-Council"). In these cases, the action areas of the groups practically matched the districts served by elementary or junior high schools.

The second tool is the district Machizukuri Plan. Once the base for machizukuri was consolidated, a future vision for the area, including physical space and related lifestyles, had to be established as a target image with the consensus of the local community. Then, a plan and strategy to carry out this ideal vision were needed accordingly.

From here, the third tool is the creation of a special "Machizukuri Ordinance" to assist machizukuri.[11,12] This tool was independently established by municipalities through council votes. This implied the official recognition of the Machizukuri Council as a municipal group and hence, of all the decisions taken by it. In parallel, a legal basis was created, which included among others a support system for councils by representatives of the administration and experts, the introduction of tax subsidies, and the preferential adoption of various projects. This kind of machizukuri ordinances were adopted in 1980 in Kobe City and in the Setagaya Ward of Tokyo, two of the most cutting-edge community activity areas where the practice of machizukuri was already well developed.

When a district Machizukuri Council is certified by the Local Administration Council based on this ordinance, an agreement is set up between the two parties. On the one hand, the administration compromises to cooperate and support the realization of the plan designed by the Machizukuri Council. On the other hand, the Machizukuri Council has to make the efforts required to carry out the plan by itself. Under such a structure, the costs for expert advisors and activities to support the activities of the Machizukuri Council are provided [Notes 8 and 9].

Furthermore, even at the national level, an exhaustive revision of the Japanese legal system had to be prepared to address machizukuri practices. By 1980, Machizukuri Plans had the support of the Machizukuri Ordinance, and yet the plans were still not legally binding.[6]

Based on a shared vision, by means of consultation, machizukuri gradually helped realize different projects that met common targets as a way to materialize participated visions for the built environment and the local community. These projects came to be defined in the Machizukuri Plans. District Machizukuri Plan agreements were easy to obtain since they bore no legal enforceability. However, even though these plans could be informally agreed upon as a whole district plan; when proposing, for example, the widening of narrow streets or joint reconstruction projects, the necessary direct consent of the land owners could not be accepted, and thus the progress of these kinds of machizukuri projects was often difficult.

Thus, at this point, the first objective was to revise the city planning legislation in order to allow more detailed planning control. Here, in contrast to the Machizukuri Plan, "District Planning" was introduced in City Planning Law in 1980 as a system that enabled the establishment of detailed planning

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conditions on the architectural form and the location and composition of streets and parks within a district, with the consent of the relevant right holders in the area. Although the agreement of the right holders was a prerequisite, through District Planning it became possible to decide aspects as precise as the height of the buildings and the position of vertical built surfaces, helping the Machizukuri Plan become more realistic.

Firth, a "Model Project" was created. The Ministry of Construction legislated "the Model Project for improvement of the community living environment" to be an advanced reference system. Since creating a new law is always difficult, the Japanese Government dedicated a special line item in the budget to these kinds of projects and set up a system in the style of an open-call to select specific machizukuri projects[13] [Note 10]. The Mano and Kyōjima districts were the first cases approved by the Ministry in 1979 to benefit from this system and to carry out the construction of their own community housing blocks. Projects for the improvement of community living environments could carry on from this point.

3.2 The second generation: Participation, collaboration, and co-creation

In this way, by the early 1980s, institutions and methods for promoting machizukuri were arranged. However, machizukuri for the improvement of the living environment accompanied by specific projects (such as cooperative reconstructions, etc.) would still face difficulties because the established model was rigid and did not leave much space for creativity.

Cooperating in joint reconstructions and street maintenance according to a district Machizukuri Plan agreed on by the Machizukuri Council meant that residents would participate in the project by putting their own property at the service of a common objective. In order to accomplish the plan, in addition to incentives (such as subsidies), the motivation of the participants and the involvement on their own initiative were indispensable. Moreover, it was necessary that the residents themselves got involved in the management of public spaces. Thus, it was essential to raise motivation to effectively involve residents throughout the whole machizukuri process, from analysis to management. In this context, in trying to break through such a situation, a second generation of machizukuri appeared.

Further on, from the mid-1980s, trying to encourage spontaneous participation and initiatives, machizukuri practice focused on supporting the legitimacy of autonomous community groups. In order to do so, projects linked diverse work topics (such as park design, improvements for disabled people, etc.) with the different groups and organizations existing within the local community, so as to produce the first specific experimental outcomes, and thus promote theme-specific autonomous machizukuri. That is to say, the machizukuri practice of the second generation corresponds with the development of specific work topics and the practical experimentation and dissemination of the appeals of machizukuri practice among the general public.

According to these new objectives, during this period, the main efforts were focused on the design of the participatory processes and the development of tools for consensus building (such as workshops) applied to specific projects. In this way, the issues tackled in these cases corresponded to particular circumstances and produced particular results. Thus, even though relevant, these first practical experiences did not reach the original aim of fostering generalized comprehensive community development movements based on local lifestyles. In other words, the main goal of machizukuri here was the invigoration of participants' collaboration, creativity, and subjectivity. To achieve this goal, clear issues that concerned residents were raised, workshops that facilitated active participation were held, and participative design experiences were attempted.

In 1978, when the magazine special issue "Community Design: By The People"[14] was published, participative design methods developed in the United States were introduced to Japanese professionals and, based on these ideas, various unique methods were attempted. Using the experiences of the first generation, creativity was boosted by the cooperation of residents, and the value of committing to machizukuri was shared.[15] For example, in densely built-up "*shotengai*" shopping areas and residential districts, residents and shop owners would pursue the creation of machizukuri guidelines and legal district planning to maintain their living and business environments, or to develop cooperative renovation projects. Moreover, through various workshops, it was possible to increase the motivation and commitment of the participants in managing and operating a variety of public facilities. This second generation of machizukuri did not only discuss and debate, but by means of citizen participation tools, various groups also established consistent schemes to help local residents engage in machizukuri in different ways.

The machizukuri groups developed in the second generation occasionally cooperated with the Machizukuri Councils established during the first generation, and carried out joint initiatives; however, at the same time, the new groups also used to work without the organization of such platforms. Most of the machizukuri activities organized at the time followed the second pattern, which responded to more independent isolated activities, separated by topic, and not leading to comprehensive activities for a whole district. In order to overcome such a weakness, machizukuri practice jumped into the third generation of regional management.

3.3 The third generation: Area management

Under such circumstances, in 1995, the Great Hanshin-Awaji Earthquake occurred [Note 11]. This was a city-type earthquake that affected built-up areas in particular in Osaka bay, being especially severe in Kobe City. At that time, the work of machizukuri initiatives that addressed reconstruction efforts supposed the birth of a third generation of machizukuri practice.

Even before the developed areas of Kobe City were struck by the earthquake, various collaboration efforts between experts, local administration, and community organizations were already taking place in the area. After the disaster, volunteers from various cities throughout Japan joined the existing networks for local cooperation and, under the accumulation of efforts, new machizukuri methods were developed and adapted.

This third generation of machizukuri thus focuses on a model of area and community management characterized by the agreement of diverse organizations to join efforts within community cooperation platforms to resolve problems in a more comprehensive way. In order to make the most of these effective initiatives, governments gradually improved their legal systems and created a legal base that granted non-profit organizations more autonomy in problem-solving, helping them assist local citizens and supporting their movements.

After the earthquake, in all the areas where reconstruction projects of any sort were carried out, regardless of their public or private nature, Machizukuri Councils were unquestionably established. In the aftermath of such a massive disaster that

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affected a great number of residents, the agreement and approval of the contents of reconstruction projects through discussions within Machizukuri Councils were necessary, even for public plans. In the case of Kobe City, such processes progressed according to existing machizukuri regulations and served as a reference for other areas. Then, at the critical time of reconstruction following the great earthquake, the activities developed by various organizations in the area that had been born during the second generation gathered under the Machizukuri Council, and thus regional management systems necessary for the reconstruction process proceeded smoothly. Gradually, different stakeholders involved at some point in the machizukuri process once again organized themselves in new platforms and organizations for regional management similar to the Machizukuri Council, but grouped around diverse themes, making it clear that such a comprehensive scheme was needed.

During the same period, the decline of historic city centers in provincial cities became a big social problem in Japan. Here, various efforts were carried out, not only in addressing planning methods, but also in promoting social systems and institutional development. In this way, machizukuri entered a period of original adaptation and evolution and started being used more widely.

3.3.1 Machizukuri management at local community and regional levels

In order to coordinate the reconstruction efforts after the great earthquake and to facilitate the revitalization of central urban areas, the third generation of machizukuri comprehensively managed the local community as a whole system by linking individual machizukuri projects with diverse goals that were born in the second generation. In short, as we have seen previously, machizukuri emerged in various forms, and its support systems and methods gradually adjusted accordingly. We can refer to the ensemble of independent actions inside a shared wider regional vision using the term "Dis-Continuous Unity" ("*Hurenzoku Touitsutai*"), which was coined by Takamasa Yoshisaka (1975).[16]

The impact that these actions had in other parts of the country is visible from the first half of the 1990s. For example, Nagahama City, a castle town built at the end of 16th century on the shore of Biwa lake in Shiga prefecture, is the first best practice case of the application of machizukuri for the revitalization of a declining historic town. In this case, the strong local merchant community, with more than 400 years of history, was responsible for establishing the machizukuri company "Kurokabe." "*Kuro-Kabe*," in Japanese, portrays the black wall of the former local bank building, which the merchants group bought with the help of the local government to spare it from demolition. Thus, a machizukuri action to protect the traditional aesthetics and spirit of the area was conducted by the third sector and co-financed by the municipal administration. From this, by linking repeated trial and error experiences for the renovation of traditional city buildings, called "*machiya*," [Note 12] the historical shopping district was renovated and hence attracted many tourists.

This is a clear example of how a corporation dealing with a first machizukuri project gradually gets involved with regional management, including various local organizations in a shared project. This case became a reference model of the third generation of machizukuri, which is characterized by area management as explained previously.

Following these experiences, in 1998, the "Machizukuri Three Laws" were created to assist the regeneration of central city areas. These laws defined a new scheme for public intervention that placed the "Town Management Organization" at the center of the process. This dedicated group was composed mainly of members of the Chamber of Commerce and Industry and aimed at accelerating urban regeneration operations.

3.3.2 The emergence of the third generation

During the first generation, the only existing groups involved in such activities were organizations for the support of machizukuri activities, pre-existing neighborhood associations (*Chonaikai*) and self-governing associations (*Jichi-kai*), and the newly created Machizukuri Council. In that context, various new organizations were born during the second generation addressing diverse topics. In the third generation, these existing groups worked together to address area management as a whole. Here, it is possible to identify three different paths to the transition into the third generation.

First, the machizukuri activities that had been carried out separately inside a district were integrated and assembled within the existing machizukuri council, and with this, the whole group took a turn toward area and/or regional management as a whole.

In a second scenario, the topic-specific machizukuri activities developed during the second generation became dominant in certain cases and gradually expanded their activities from isolated actions to proposals and visions for whole residential areas.

Third, new intermediary support organizations were born to give support and cooperate with the various actors involved in regional actions. These intermediary groups gently nurtured cooperation under a common ideal and materialized regional management as a whole.

Nevertheless, it is important to point out that not all of the various machizukuri organizations existing in each area continued their activities up to the second generation, nor were all cleanly organized and integrated inside the regional platforms of the third generation.

While gradually walking either of the above paths, experts and administrations supported these machizukuri groups. Once the first holistic model appears in an area, it will continue spreading so as to include and assimilate new projects, one after another, and this structure will continuously help channel different improvement efforts for the whole region. Here, we could use the term "assemblage" method to refer to this kind of integrative and evolutive system.

At this stage, the goal is to create a mechanism to motivate new forms of governance for the local community in which multiple agents cooperate with one another. Therefore, based on this mechanism, in order to improve the built environment, it is necessary to develop specific planning techniques that will be described here. Thus, the method called "machizukuri," which has evolved throughout half a century since its birth, can not only improve the living environments of communities, but it can also play a vital role in solving problems of diverse natures, such as welfare, education, the regional economy, and environmental problems, while at the same time channeling and materializing visions for the future of the whole region.

According to the previously explained development process and history, machizukuri can be defined as a series of persistent activities planned to "improve the life quality" of a town. Based on the resources of a local community and unifying the various subjectivities in cooperation, machizukuri activities seek to enliven the town by energizing its communities and bringing forth the charm of the area.[10]

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4. Research and development on the method of machizukuri

This section introduces the specific machizukuri methods developed by the author of this paper, shown side by side with the general development of machizukuri theory and practice.

4.1 Incremental linkage of collaborative infill projects

The branch of machizukuri dedicated to the improvement of living environments focuses especially on the improvement of environments where there are a high concentration of aged wooden houses, still inhabited, and where most of the residents are also land and leasehold owners. However, in these densely built-up wooden areas it is difficult to fully tackle the improvement of the living environment by rebuilding individual houses or wooden apartments. Instead, we must gather several houses, shops, or land lots under cooperative redevelopment projects, which can leave a more fruitful impact on the urban fabric.

In these districts where humble houses in bad conditions are densely populated, it is not rare for the local Administration Office to purchase several lots inside a dense urban area and to construct public rental housing blocks as a way to carry out redevelopment under a legal designation. These projects allow the original residents to move into the new constructions. However, such a method is not ideal for residents who wish to improve their living environments by their own initiative and experience. Nevertheless, it is also difficult to secure the land ownership in the first place.

Here, machizukuri can assist groups of small landowners, who are also residents and users of the neighborhood, with the shared process to carry out their own local redevelopment projects. Further, when necessary, the public rental housing system will also be part of the project. This system of collaborative infill rebuilding is what we call a "machizukuri citizen project." When these kinds of projects repeat in an area, they can be combined to achieve a gradual improvement of these densely built-up areas. This strategy serves as a method for the improvement of urban areas through the concatenation of citizen projects, which is explained below.

First, already in the latter half of the 1970s, when the first generation of machizukuri started growing, this author proposed a method for a "block improvement program" which presented an image for the gradual maintenance of the urban fabric. Here, recommendations were made on how to maintain the spatial image of the urban environment according to diverse patterns of incremental development of the different blocks within one site spatial unit. The study also explored the standards and legal systems concerning the density and conditions of the open space that would be needed to materialize this vision.[17]

Second, trying to put this theory to practice, the author of this paper also participated in the machizukuri project for the Nakacho Atago district in Ageo City and worked on the development of individual methods to support the theoretical base as previously defined [Note 13][17,18]. At the time, the group of practitioners who undertook this endeavor only presented basic ideas and visions for the area; however, more relevantly, these individuals embodied the spirit of the emerging machizukuri practice and this was one of the first attempts to gather their ideas under a common project. The author of this paper participated in the discussions and took part in the following related initiative. By 1993, four projects were linked to the area, each one made up of different actions (see Figure 1).

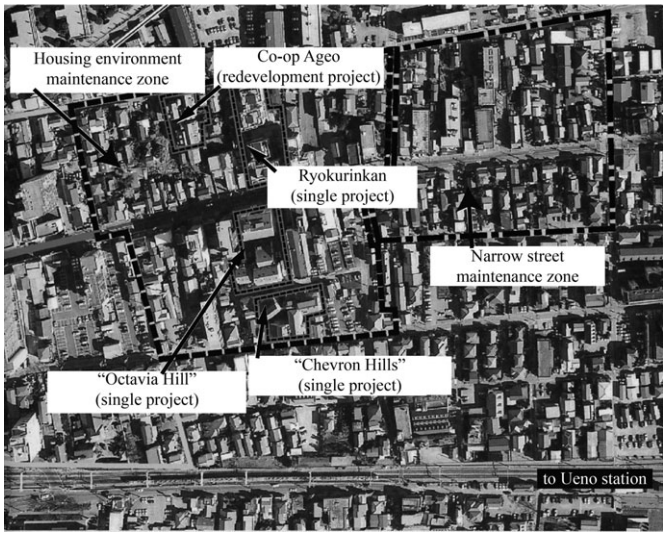

Figure 1. Nakacho-Atago improved district environment through linkage of collaborative infill projects: pre-existing condition and action program

This method became a best practice model of regeneration for densely built-up wooden urban areas in Japan and was later repeatedly used in the reconstruction project that took place after the Great Hanshin-Awaji Earthquake. Furthermore, throughout this project, the working group compiled and then published the overall project picture, presenting it as a reference methodology for other cases.[19] Here, the project made clear that a basic goal for this kind of action was to enable the collaboration between resident landowners and adjacent building lots, and to also allow all the residents, including tenants, to continue living in the district.

To that end, a method for consolidating the urban fabric by collaboratively building multi-unit dwelling complexes was developed. In it, various forms of property rights mix in one project. This involves creating and organizing a network of complicated relationships between diverse right holders. In this case, the original constructions are transformed and substituted by new types of dwellings, such as rental apartments adapted to the needs of new residents, public housing for low-income tenants, and so forth. The application of a linkage method to collaborative infill projects proved that it is possible to gradually improve whole districts by sequentially carrying out these kinds of actions.[11]

Third, within such a gradual process, the next task was to develop "Architypes" of buildings that matched the existing spatial context. This approach was based on the theory developed by Muratori in Italy who coined the notion of "tipologia," referring to the architectural formal typologies that compose an urban fabric. Resuming this concept, "Architypes" refer to the different typological and/or theoretical units designed to solve specific problems and that meet certain new requirements while respecting the standard dimensions of the existing context (see Figure 2).

From personal experience, through cutting-edge machizukuri "design games," which will be described later, this author was able to develop a method to jointly design reconstruction and redevelopment Architypes and machizukuri guidelines that were implemented in Ageo city.[18]

Fourth, the method explained above was taken one step further, presenting the means to assist "machizukuri citizen

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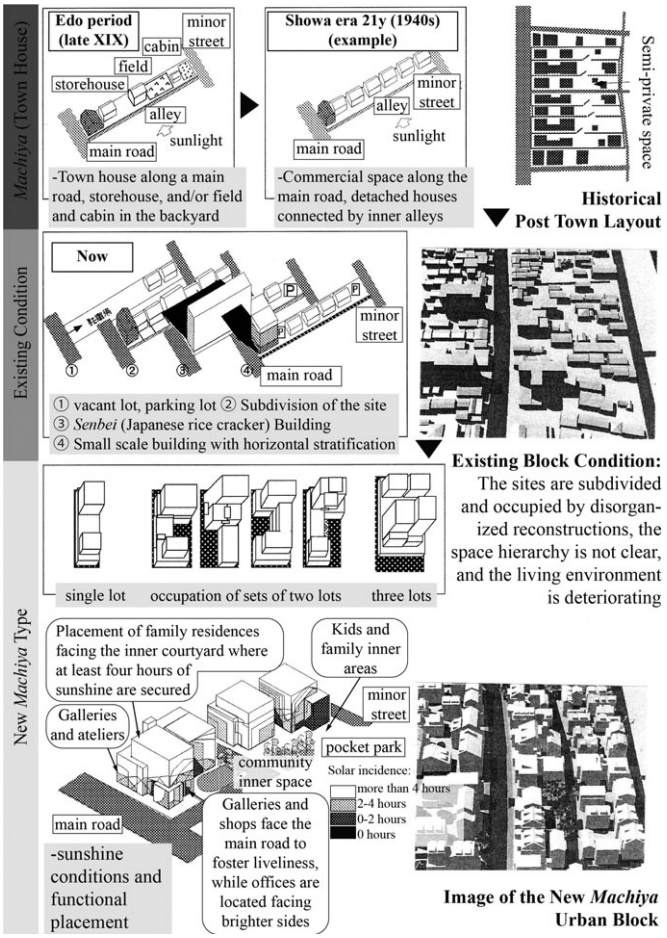
Machiya (Town House)
Edo period (late XIX)
minor street
cabin
field
storehouse
alley
sunlight
main road
-Town house along a main road, storehouse, and/or field and cabin in the backyard
Showa era 21y (1940s) (example)
minor street
alley
sunlight
main road
-Commercial space along the main road, detached houses connected by inner alleys
Semi-private space
Historical
Post Town Layout
Existing Condition
Now
minor street
main road
① vacant lot, parking lot ② Subdivision of the site
③ Senbei (Japanese rice cracker) Building
④ Small scale building with horizontal stratification
Existing Block Condition:
The sites are subdivided and occupied by disorganized reconstructions, the space hierarchy is not clear, and the living environment is deteriorating
single lot
occupation of sets of two lots
three lots
New Machiya Type
Placement of family residences facing the inner courtyard where at least four hours of sunshine are secured
Kids and family inner areas
minor street
Galleries and ateliers
pocket park
community inner space
Solar incidence:
more than 4 hours
2-4 hours
0-2 hours
0 hours
main road
Galleries and shops face the main road to foster liveliness, while offices are located facing brighter sides
-sunshine conditions and functional placement
Image of the New Machiya Urban Block

Figure 2. Block transformation and emerging architypes for Ageo city: finding new forms of *Machiya* town houses as reconstruction architypes (adapted from Nojima,[31], p. 153)

projects" in which diverse entities, not only resident landowners, participated in and developed various business schemes together. This method was born from various trial and error practices aiming at the regeneration of central urban areas during reconstruction processes.

The skills learned here were applied successfully as a series of methods to the Enma street District in Kashiwazaki City, Niigata Prefecture, which in 2007 had suffered the biggest damage caused by the Chuetsu-oki earthquake. In 2017, this project received the Urban Design Award by the Japan Urban Housing Institute.[20]

Finally, through the integration of different independent machizukuri actions, a different project tried to create a "flowing" urban space that connected intermediate areas inside the blocks. The total project vision linked the common space provided by each joint reconstruction action, creating and editing a shared physical network along which residents could move freely through the various places connected in the neighborhood. This whole assemblage of projects under a wider vision constituted a new method to increase the quality of the residential environment in densely built-up urban areas.

This project was neither determined by a whole machizukuri plan for the block nor by other traditional planning tools. In this case, the ideas for the reconstruction were shared as a guideline, which was then mutually edited by experience through continuity and the linkage of projects for smaller areas, finally achieving the creation of the imagined vision for the whole area. The process proposed above was partially put into practice after the Great Hanshin-Awaji Earthquake by some machizukuri projects for reconstruction, as is explained in Figure 3.

4.2 Machizukuri design game by local residents

In the machizukuri process, it is important for residents and stakeholders to recognize the situation of their own town and to collaborate in the design of its future image. Moreover, machizukuri does not fall into somehow deceitful participation forms, but rather advocates for a creative process of collaborative analysis and discovery that later moves into well-grounded urban design projects agreed on through local consensus. Machizukuri can thus produce rich results for both the built environment and the participants themselves. In this context, the author of this paper developed a model program for machizukuri practice that incorporated gaming and simulation tools, such as using town scale models and video simulation systems. Through practice, this has become the usual package assisting participated design.[22,23]

4.2.1 Overall picture of participatory design

The machizukuri participatory process can move in three different directions as shown in Figure 4. The first aim is the design of the machizukuri project in itself. The second is to design the rules of this machizukuri process, and the third aims at helping the participating residents express by themselves and directly interpret and define their position in the town. These three dimensions evolve following common steps. First (starting from the center of Figure 4), the project goes through a phase of analysis and the "common recognition of the town." Next, the process leads into a phase of "sharing an agreed target image" for the area. Finally, the method involves "design practice."[24] According to each of these steps and goals, different methods for participation are prepared (see Figure 4).

Analyzing each of the steps in detail, the first responds to the definition of a common image of the town and its local lifestyles, based on which participatory machizukuri efforts originate. While walking around and observing the town, different methods to spot the issues and special resources of the town, to understand each other, and to promote mutual understanding are practiced. Especially at the early stages of machizukuri, this analysis is done through the participation of an unspecified number of residents, with the aim of excavating in their memories and bringing up their special impressions and images of the town. This helps to develop the attachments and the motivation required to go through the whole machizukuri process.

The second step is to define and share a target image for the machizukuri project. Residents become the core of the project, discussing what is possible through machizukuri, what machizukuri is going to do, what kind of town can be developed through machizukuri, and so forth, and fostering this common image.

The third step is the practice of design to finally realize the specific goals of the machizukuri project. This stage includes a broad range of dimensions, from physical design to the definition of action and management roles, according to both rights owners and users. We can cite among others the design of public spaces, the establishment of collaborative reconstruction efforts, the creation of machizukuri rules for district planning, and so forth. Based on the realization of small design works and forms of expression, for example, murals, benches, flowers along streets, and so forth, it is possible to directly materialize

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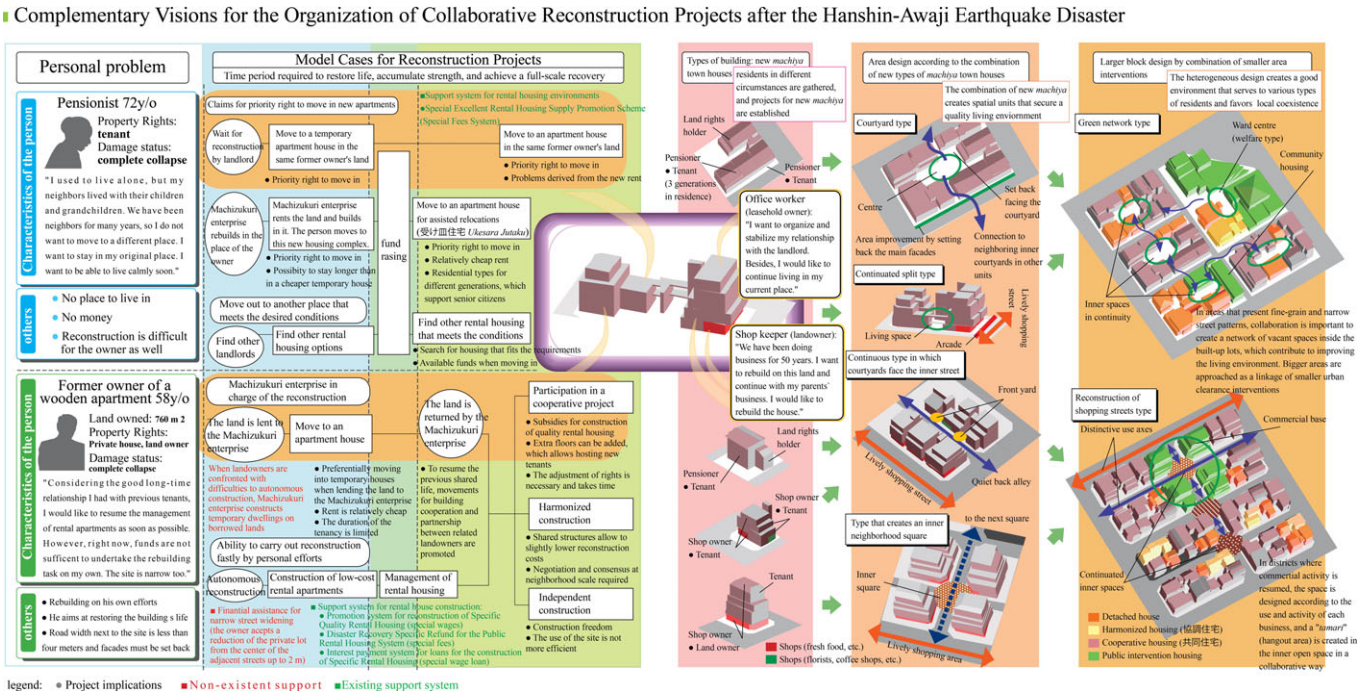
Complementary Visions for the Organization of Collaborative Reconstruction Projects after the Hanshin-Awaji Earthquake Disaster
Personal problem
Model Cases for Reconstruction Projects
Time period required to restore life, accumulate strength, and achieve a full-scale recovery
Characteristics of the person
Pensionist 72y/o
Property Rights: tenant
Damage status: complete collapse
"I used to live alone, but my neighbors lived with their children and grandchildren. We have been neighbors for many years, so I do not want to move to a different place. I want to stay in my original place. I want to be able to live calmly soon."
others
No place to live in
No money
Reconstruction is difficult for the owner as well
Former owner of a wooden apartment 58y/o
Land owned: 760 m 2
Property Rights: Private house, land owner
Damage status: complete collapse
"Considering the good long-time relationship I had with previous tenants, I would like to resume the management of rental apartments as soon as possible. However, right now, funds are not sufficent to undertake the rebuilding task on my own. The site is narrow too."
others
Rebuilding on his own efforts
He aims at restoring the building s life
Road width next to the site is less than four meters and facades must be set back
Claims for priority right to move in new apartments
Support system for rental housing environments
Special Excellent Rental Housing Supply Promotion Scheme (Special Fees System)
Wait for reconstruction by landlord
Move to a temporary apartment house in the same former owner's land
Priority right to move in
Move to an apartment house in the same former owner's land
Priority right to move in
Problems derived from the new rent
Machizukuri enterprise rebuilds in the place of the owner
Machizukuri enterprise rents the land and builds in it. The person moves to this new housing complex.
Priority right to move in
Possibity to stay longer than in a cheaper temporary house
fund rasing
Move to an apartment house for assisted relocations (受け皿住宅 Ukesara Jutaku)
Priority right to move in
Relatively cheap rent
Residential types for different generations, which support senior citizens
Move out to another place that meets the desired conditions
Find other landlords
Find other rental housing options
Find other rental housing that meets the conditions
Search for housing that fits the requirements
Available funds when moving in
Machizukuri enterprise in charge of the reconstruction
The land is lent to the Machizukuri enterprise
Move to an apartment house
The land is returned by the Machizukuri enterprise
Participation in a cooperative project
Subsidies for construction of quality rental housing
Extra floors can be added, which allows hosting new tenants
The adjustment of rights is necessary and takes time
When landowners are confronted with difficulties to autonomous construction, Machizukuri enterprise constructs temporary dwellings on borrowed lands
Preferentially moving into temporary houses when lending the land to the Machizukuri enterprise
Rent is relatively cheap
The duration of the tenancy is limited
To resume the previous shared life, movements for building cooperation and partnership between related landowners are promoted
Harmonized construction
Shared structures allow to slightly lower reconstruction costs
Negotiation and consensus at neighborhood scale required
Ability to carry out reconstruction fastly by personal efforts
Autonomous reconstruction
Construction of low-cost rental apartments
Management of rental housing
Finantial assistance for narrow street widening (the owner accepts a reduction of the private lot from the center of the adjacent streets up to 2 m)
Support system for rental house construction:
Promotion system for reconstruction of Specific Quality Rental Housing (special wages)
Disaster Recovery Specific Refund for the Public Rental Housing System (special fees)
Interest payment system for loans for the construction of Specific Rental Housing (special wage loan)
Independent construction
Construction freedom
The use of the site is not more efficient
Types of building: new machiya town houses
residents in different circumstances are gathered, and projects for new machiya are established
Land rights holder
Pensioner
Tenant
(3 generations in residence)
Office worker (leasehold owner):
"I want to organize and stabilize my relationship with the landlord. Besides, I would like to continue living in my current place."
Shop keeper (landowner):
"We have been doing business for 50 years. I want to rebuild on this land and continue with my parents' business. I would like to rebuild the house."
Shop owner
Tenant
Land owner
Area design according to the combination of new types of machiya town houses
The combination of new machiya creates spatial units that secure a quality living enviornment
Courtyard type
Centre
Set back facing the courtyard
Area improvement by setting back the main facades
Connection to neighboring inner courtyards in other units
Continuated split type
Living space
Arcade
Linked shopping street
Continuous type in which courtyards face the inner street
Front yard
Lively shopping street
Quiet back alley
Type that creates an inner neighborhood square
to the next square
Inner square
Lively shopping area
Shops (fresh food, etc.)
Shops (florists, coffee shops, etc.)
Larger block design by combination of smaller area interventions
The heterogeneous design creates a good environment that serves to various types of residents and favors local coexistence
Green network type
Ward centre (welfare type)
Community housing
Inner spaces in continuity
In areas that present fine-grain and narrow street patterns, collaboration is important to create a network of vacant spaces inside the built-up lots, which contribute to improving the living environment. Bigger areas are approached as a linkage of smaller urban clearance interventions
Reconstruction of shopping streets type
Distinctive use axes
Commercial base
Continuated inner spaces
In districts where commercial activity is resumed, the space is designed according to the use and activity of each business, and a "umari" (hangout area) is created in the inner open space in a collaborative way
Detached house
Harmonized housing (協調住宅)
Cooperative housing (共同住宅)
Public intervention housing
legend: Project implications
Non-existent support
Existing support system

Figure 3. Complementary visions for the organization of collaborative reconstruction projects after the Hanshin-Awaji earthquake disaster Source: Satoh S, Fujii T, Fujita W, Matsumoto K, Mano Y, Yamamoto H, Ryiu M, Watanabe G, *Doujunkai no Jisseki kara Manabu* (Learning from Practices of Dojunkai Foundation), Zoukei no. 1, pp. 100-105, Kenchiku Shiryou Kenkyuu Sha, Tokyo, 1996 (in Japanese)[21]

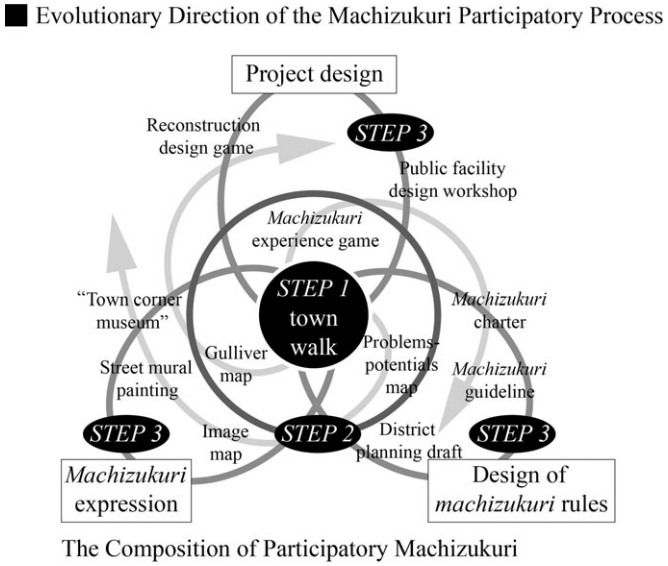

Figure 4. Framework of participatory Machizukuri method (adapted from Satoh, 2005[24])

the image of life in the town that the residents had ideated in the first stage, and express it in the form of projects for the area.

To achieve these goals, the use of workshops that address local topics and analysis allows the participants to set clear goals. This package of tools has proved to be effective in every machizukuri process. Through practice, our team understood the need for a clear package of tools to assist in the creation of machizukuri projects and rules to proceed with the recovery. Thus, the team worked on the development of what we called the "machizukuri design game." By means of this method, participants become the main actors of machizukuri, getting involved in co-creative design and increasing their motivation.

4.2.2 Development and practice of various types of workshops

The previously mentioned package of tools for participatory design consists of the following elements.[24]

First, we can find workshops where participants, through round-table discussions, share and collect ideas and discover problems and possibilities. In these workshops, the participants will note important findings and suggestions on cards, paste them on a table and/or a wall, and together examine the town and the machizukuri process while decoding existing relationships between ideas.

The second tool in the package is a type of workshop in which participants will relate their thoughts, ideas, things they want to cherish, or town problems to specific places on local town maps. For example, the "Gulliver Map Workshop"[25] in which participants exchange opinions on the historical situation, current situation, and possibilities for the area on a large map. Through this, the participants are able to become "Gulliver"-like giants and overlook the town from above to keep in their minds the image of the concrete place they refer to. This kind of workshop starts first with walks together around the town. Each participant then writes his/her impressions on the map, fostering the common recognition of the shared issues.

The third method is the joint design and simulation of the future image of the town, using exchangeable parts on a model of the area. The participants will surround the model, in a scale of 1/100 or 1/200 if the target area is wide, and use various removable parts representing the proposed urban and architectural elements to establish a desired image of the future

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city. While playing with each of the model roles on the scale model using "chance cards" that mention various future events that could occur (e.g., fires, planning to build high-rise apartment buildings in the neighborhood, the development of macro-infrastructure, etc.), participants can easily express themselves and discuss the possible events and their effects on their living environment.

Using exchangeable elements on a town model and visualizing the obtained images by introducing a microscopic camera in the model, in these kinds of workshops, participants can simulate changes in the physical form of their neighborhood, and with it, experiment with different alternatives before together defining a future image of the area. This role-playing game allows the participants to simulate and confront by themselves the conflicts that might arise throughout the machizukuri process in advance. This helps them to understand the implication of their decisions, the importance of collaboration and compromise, and consensus building. Figure 5 presents the model and contents assembled during a workshop of a similar kind with local residents.

Fourth, another type of workshop will address experts and confront them with the ideas and visions developed by local residents. These experts will surround the models, create alternative proposals, conduct various evaluations, and exchange their points of view. In a subsequent workshop, experts will prepare several alternative models for consensus building to realize the project. The used methodology here varies according to the aims and nature of the projects, such as collaborative reconstruction projects, district plans, guidelines, and so forth.

4.2.3 Machizukuri design simulation

Simulations can confirm and strengthen the aims of the various machizukuri activities, visualizing the process and results, and providing feedback on the proposed plan in advance. Moreover, this is a powerful method to facilitate communication and agreement between various entities, to foster consensus, and to assist in the formation of new partnerships that will be necessary to carry out the agreed development ideals. The simulation of the machizukuri process includes an action process and the future lifestyles in the area, not merely the simulation of the modifications on the physical environment; this makes it possible to imagine the appearance of local life, trading and business exchanges, children's play areas, and the activities of local people. For that purpose, in order to simulate the shape and activities of a vivid town, we developed a simulation device to visualize a 1/100 model from the position of the human eye. This device uses a microscopic camera that is remotely controlled by a manual remote control and monitored on a computer. The camera can move inside the models and generate images on the screen, such as for participants to recreate the impressions of human beings walking freely around the actual neighborhood [Note 14]. Participants can see the images and experience the sensations they would feel in their town after the completion of the machizukuri project and evaluate each other's impressions through participant discussion, as can be seen in Figure 6. The fact that they are able to move the camera, play with the model, and modify the proposals by themselves is necessary to successfully design a future image of the town and the local living environment.

The research team developed three kinds of simulation devices. The first type of equipment can be easily carried around, used by hand, and checked during the design game. The second is a movable device in which the camera is attached to an assembled frame, and is used to present the results of the design game during a workshop and so forth. The third piece of equipment is a large system installed in the research studio, connected to a computer, in which the camera moves via an automatic control inside the model so that it simulates walks around the streets and alleys while recording images of this walk. This type of machizukuri design game assists the participated design of the town through an interactive co-creation process.

Based on the experimental models and ideas assembled during workshops, the experts will present a new model that

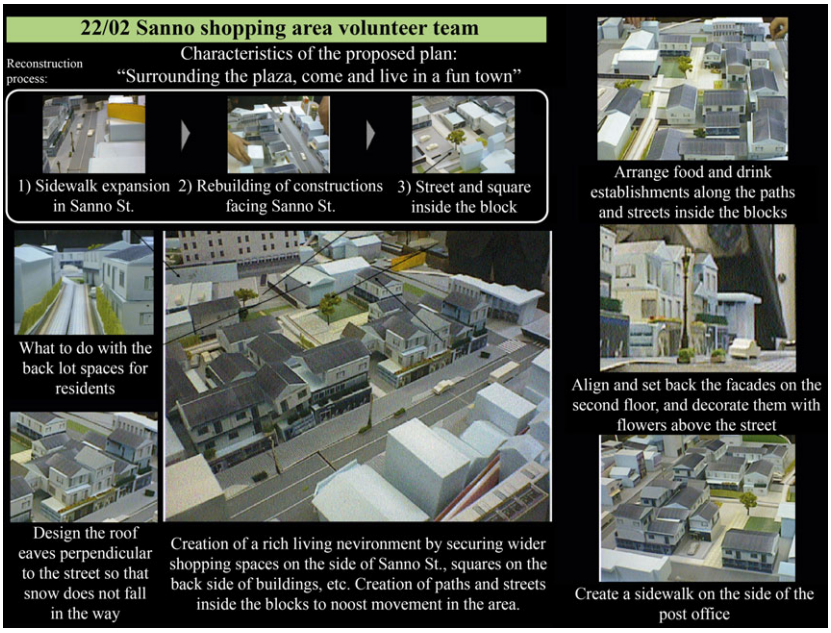
22/02 Sanno shopping area volunteer team
Reconstruction process:
Characteristics of the proposed plan:
"Surrounding the plaza, come and live in a fun town"
1) Sidewalk expansion in Sanno St.
2) Rebuilding of constructions facing Sanno St.
3) Street and square inside the block
Arrange food and drink establishments along the paths and streets inside the blocks
What to do with the back lot spaces for residents
Align and set back the facades on the second floor, and decorate them with flowers above the street
Design the roof eaves perpendicular to the street so that snow does not fall in the way
Creation of a rich living nevironment by securing wider shopping spaces on the side of Sanno St., squares on the back side of buildings, etc. Creation of paths and streets inside the blocks to noost movement in the area.
Create a sidewalk on the side of the post office

Figure 5. Suggestions by the Machizukuri game groups: summary of ideas for the future of the area (Tsuruoka City)

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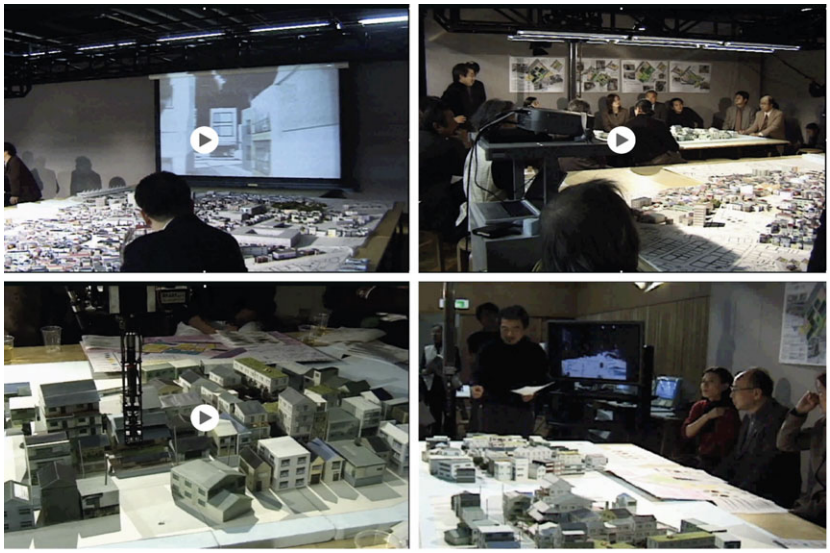

Figure 6. Workshop with experts and residents at Waseda University Lab using a Design and Landscape Simulation System

assembles these hopes and presents an alternative plan, which will be discussed during the next workshop. Again, the process of simulation and modification will be repeated, and the plan will gradually mature. In other words, this process incorporates the simulation of the future appearance of the town and the gaming process related to the creation of actual agreements on cooperation efforts. This means that if an agreement is formed in this way, the actual process of project development, including the implementation of the agreed design and ideals, will proceed smoothly.[24,26]

4.3 Research and development of local governance and area management

Aiming at consolidating machizukuri processes for area management, which was attempted by the third generation mentioned above, the author of this paper introduced the following two innovative methods. The first is the design of evolutive scenarios that allows for the sustainable planning of actions, partnerships, and effects of the machizukuri project over time. This method enables visualizing, sharing, and assembling the progress in the creation of a system for regional management composed of multiple lines of machizukuri practice with diverse entities and stakeholders cooperating simultaneously. The second is the definition of an action research plan in order to ensure the transparency and accountability of the machizukuri process. This progressively improving problem-solving method takes into account the experiences of different teams and strengthens the public character of the project.

4.3.1 Scenario design: Writing and making

In machizukuri, designing a long-term process is essential. Objectives cannot be achieved by only a single project, but by assembling the efforts of several large and small projects. With this, various ripple effects can originate and be boosted, and the built environment and local community are gradually improved. If such a scenario is visualized, shared by the local community and opened to the outside public, it is possible to foster the participation of diverse entities. However, it is difficult to completely plan and control an uncertain future in which discontinuous machizukuri actions are assembled. Aiming at achieving stable results, it is effective to draw a scenario for the progress of the machizukuri project in which various entities intertwine, to visualize it, to share it with the parts involved and the community, and to strategically edit each of the represented activities [Note 15].

Scenario design in machizukuri can be defined as "a method to assemble machizukuri activities of various related entities into a target image, forecasting changes in the socioeconomic and physical environments in the area covered by the machizukuri activity."

In other words, this means to portray machizukuri as a "series of scenarios" consistently evolving from the past to the present and toward the future.[27] This scenario design can be roughly classified into three different approaches. The first method is to draw cooperative scenarios as a simulation of the future situation through the continuous organization of participative workshops, and so forth. Then, at the turning point of machizukuri, a second type of scenario in which experts and leaders strategically and intentionally design the future action needs to be drawn. The third method consists of the visualization of scenarios in which a variety of decision-making processes overlap, and which otherwise would be unconsciously and less effectively formed.

The scenario in which machizukuri takes place is not just a map for machizukuri practice. Based on past circumstances, it will present and validate the current environment, consider and analyze various circumstances that can occur inside and outside the targeted area, and also present the plurality of future predictions and changes in the regional situation, expressing them as several branches and turning points in the plan. Through this scenario design, it is thus possible to increase the vision and awareness of the future of the area in which the involved stakeholders live and develop their activities. Moreover, this also helps to nurture the power of machizukuri to plan alternatives and respond to uncertainty.

4.3.2 Action research for transparency and accountability

The method of action research also advances together with the scenario design. It expresses the results of the different trial and error attempts of machizukuri practice in a visible form, is reviewed by relevant entities, and the method continues its improvement. Machizukuri, dedicated to the improvement of

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the area management model in which multiple stakeholders collaborate, makes use of the administration to assist the process, introduces new taxes, nurtures the cooperation of diverse entities in the area, and so forth. With this, machizukuri helps to strengthen the public side of the model. Moreover, projects and activities require an objective review from both inside and outside the community on a regular basis; that is why the participation of the public sector is essential for the machizukuri project. Furthermore, machizukuri in itself is regarded as action research, and thus is unfinished and open for development and the integration of new actors. With this, its openness to both the inside and outside public is required.

It has repeatedly been said that the process of machizukuri undergoes complicated stages involving activities by multiple agents. Accordingly, action research is difficult to express by a single track PDCA (Plan-Do-Check-Action) model, which is normally used to define a single product or technical development. Here, it is especially important to conceive a big plot for action using the scenario design strategy, and to express it as action research in which achievements are gradually accumulated.

The machizukuri process follows parallel PDCA circles comprised of intervention in the research process, the planning and implementation of plans and initiatives, a review of the outcomes, considerations for forthcoming improvements, and reflecting on the plans over and over again; these cycles are represented here in the shape of spiraling diagrams.

Machizukuri responsible for developing regional projects and overall area management systems not only needs to bring about results, but it also needs to explain the process. The method of action research clearly presents these processes, evaluates them, and helps to improve the results of the interventions. At the same time, action research places emphasis on openly explaining what the project is trying to achieve and repeatedly disclosing these goals since throughout the process the project must edit and confirm the progress of the different action lines and the role of each entity in the overall vision. Thus, we can defend that this is a creative method that brings about better results than other linear pre-established approaches. The method of assembling consecutive steps under common objectives and an overall vision is the method of action research and scenario design used by machizukuri.

4.3.3 Spiral maps for scenario design and action research

In order to review machizukuri as action research, it is effective to illustrate the machizukuri process and to visualize it as a scenario for past, present, and future actions. This scenario is drawn in the shape of a spiral as shown in Figure 7 and shared as a reference model with the general public. A main spiral represents the whole project's vision and flow. From it, subspirals are drawn for each individual project, and are connected to the general nexus. If each of the events represented in the spiral map is properly linked to archival materials or correspondent data bases of the machizukuri project, the model can be used in an even more effective way, providing specific complementary project data.

Figure 7 represents the action plan that was drawn together with the residents of Namie Town in Fukushima Prefecture after the accident at Fukushima Daiichi Nuclear Power Plant in March 2011, which directly affected their hometown, forcing the residents to evacuate their living areas. The figure, in the shape of a spiral map linked to a database, presents efforts carried out and plans to rebuild the community. In this case, machizukuri spirals are drawn for each district, and with this it is possible to visualize the different networks for city and community making in relation to each other (Figure 8).[28,29]

In machizukuri, these methods are still used experimentally. However, as machizukuri does not only work on the design of the physical environment, but develops social and lifestyle implications, not only among the local community, it is necessary to have mechanisms in place to widely open the plans and ideas to society as a whole.

5. Discovery and emergence of real machizukuri

Modern city planning is based on stable top-down generalized approaches and tools and is subject to standardized procedures. On the other hand, machizukuri has the ability to empower communities, as it can tackle sensitive problems and find more suitable tailor-made solutions for them (e.g., special problems related to aging societies). Machizukuri can also help create a stable base for community problem-solving, education, and awareness, which is adaptable to their different specific contexts and diverse scales. Thus, it can work as a complementary parallel support system to the institutionalized generic top-down approach. The practice of machizukuri can alleviate the weight of the many governmental responsibilities and establish parallel layers of management that otherwise might be difficult to reach using standardized methods. Thus, currently, a "machizukuri democracy" is emerging and opening up new possibilities for a shared inclusive future.

Since the late 1960s, the machizukuri that emerged from each different territory and area has clearly defined its shape in the last half of the 20th century. We understand now that the period ranging from the latter half of the 20th century to the 21st century bore witness to the process of discovery of machizukuri.

Machizukuri was born as a response to the different problems affecting different places, and it was developed based on the thoughts and ideas of the local residents with their respective different intentions. Even though at first there was no specific model for machizukuri practice, what defined the movement was the existence of a common philosophy and the determination of residents to act on their own initiative to solve their local problems making use of their own power. Gradually, various machizukuri parallel practices developed their own trial and error experiences, exchanged information, and developed machizukuri to its now recognizable state.

Such processes were previously unseen social experiments that addressed residents, local governments, and experts, such as architects, who questioned the modern architecture and urban spaces that only keep track of functions in a uniform manner. Through the cooperation of these three parties, small projects were brought together to create a "place" called a town. The word "place" does not portray a built environment without motion; it also includes social exchanges and activities in the area we refer to. Through various workshops, images for the area, its appearance, and local life are exchanged, mutual checks and edits are done, and the results of machizukuri gradually appear before our eyes.

Opinions are also exchanged in design games using models and by experiencing virtual reality together with images seen by the human eye. For example, "I want this place," "The building behind should be a little lower to gain more sunlight," "The road does not need to be so wide and straight, it is also ok if it zigzags," "But considering disaster prevention, it is better for the road to be neat," and so forth. Through these

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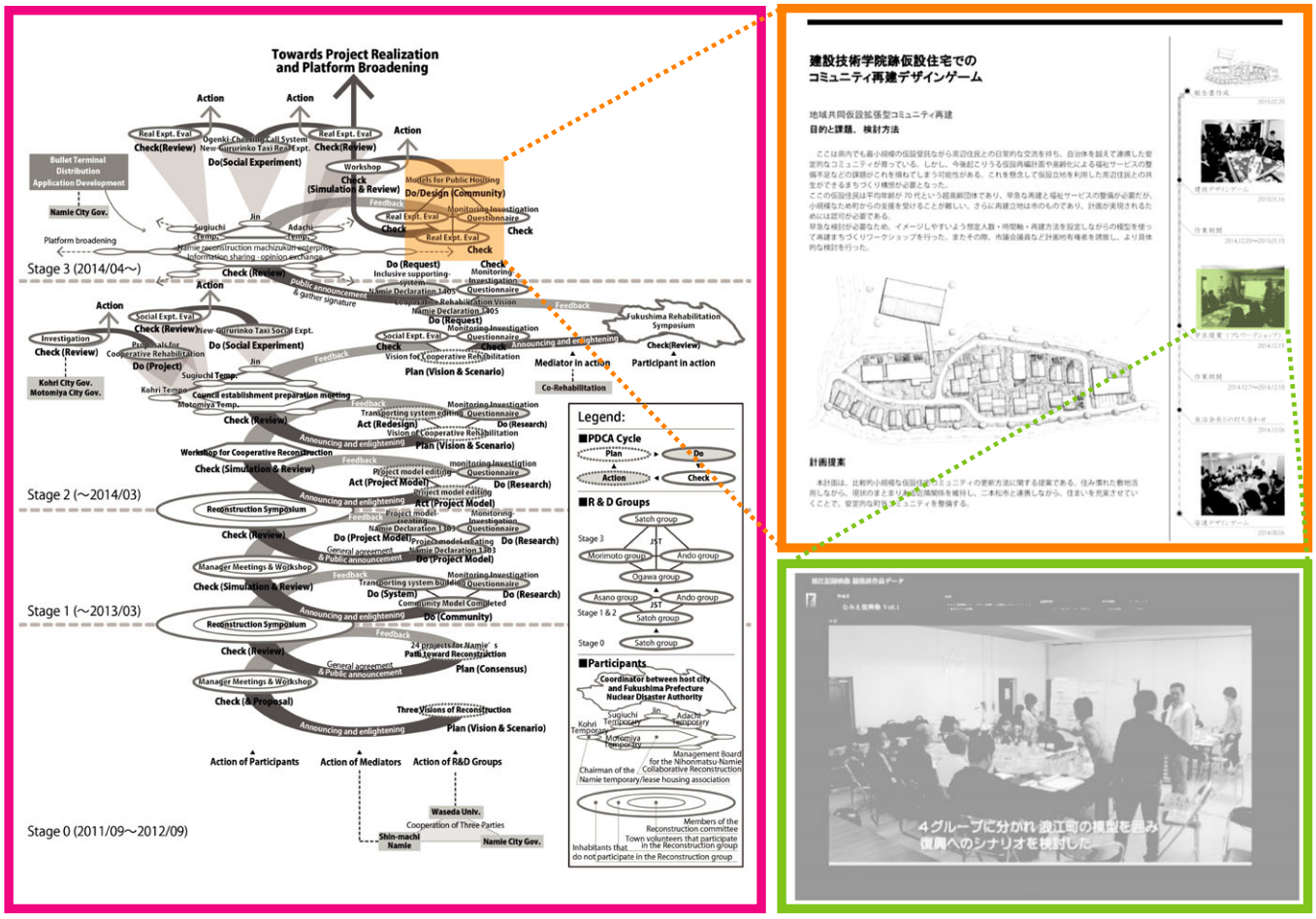

Formation process of network and community · · · **Overall project as an action research process**

Project archive ··· **Contents of each especific project, background, and development**

Video archive ··· **Contents of the social examination of the project and workshop (in picture: discussion time)**

Figure 7. Spiral diagram representing the Machizukuri scenario of the action research process in Namie town (adapted from Satoh, 2015, p. 41[28])

Figure 8. Workshop with refugees of Namie-Machi in Fukushima Prefecture for designing and building their new remote outer community in relocation areas (adapted from Satoh, 2015, p. 41[28])

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discussions, a matching image of the town gradually reveals itself. This is what we call interactive editing. The term refers to a method for mutual design by which it is possible to co-create modern cities that transcend the modern era.

Separate thoughts are assembled and spaces that match the feelings and spirit of the people are created. According to modern legislation, urban space is clearly divided in public or private, but more ambiguous places, like traditional meeting spaces and alleys, are part of the urban fabric and bear special qualities that are also desired. In this way, machizukuri creates a built environment responding to the accumulation of people's experiences and establishes a democratic local community with its own ideas and power.

6. Conclusions

Machizukuri, which has evolved for half a century since its birth in the 1960s, is expected now to find new ways to further enhance the results described above, and to explore new horizons. To conclude this paper, I would like to conclude the discussion addressing some of the remaining issues and future possibilities for machizukuri practice.

In the first place, the goal of machizukuri is to establish what is called a "school of democracy," practiced by groups of individuals in their neighboring living areas. Consequently, machizukuri has attempted different practices and methods to overcome existing fragmented identities, to gather and integrate them, and to finally reach a form of democracy that takes place in the public sphere, with machizukuri at its base. Here, the crux of the matter is to elevate machizukuri practice from the level of local residents and stakeholders, to a broader territorial scale, involving the whole citizenship. This means to glocalize machizukuri and to open it to the world.

To achieve this ideal, it would be necessary to further develop the following techniques and methods.

First, more scientific and social legitimacy are required. In addition to the results that emerge from action research, a mechanism for accumulation and assessment of machizukuri records from the standpoint of an objective third-party is needed. This asks for additional theoretical research and the creation of new systems for visualization and presentation of the machizukuri process.

Second, although machizukuri tries to ease the coexistence of varied postures, which may contradict each other, it is still necessary to better collect, assemble, and adjust all these different realities to obtain better results. To do so, it is essential to further research on legal systems and tools. For example, while modern urban planning and building legislation allow the specification of mixed uses, the definition of clear delimited urban uses is still their main object. As a result, there is no possible way that such methods can lead to more conciliatory and effective results. Thus, machizukuri must search for specific techniques and methods that allow the assemblage and edition of heterogeneous materials, and the reconstruction of social mechanisms.

Third, another strategy should be concerned with the creation of aesthetic value with the aid of machizukuri actions. So far, the diverse co-creation processes explained above have not yet reached the desired aesthetic quality. Thus, in the long term, nurturing social skills will be essential to deliver results of a certain aesthetic value from machizukuri practice.

As a final remark, it is important to stress the fact that machizukuri will still have to face several challenges in the next half century, but it is my sincere hope that future research will help overcome current issues and contribute to people's peace and happiness worldwide.

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Notes

Note 1) Written documentation on Japanese machizukuri is vast. One of the most comprehensive pieces of literature is a series of 10 thematic books published by the Architectural Institute of Japan (2004),[10] to which Shigeru Satoh, the author of this paper, was a chief editor, and which has become a classic reference work. In each of them, researchers simultaneously involved in on-site practice in each related field were responsible for the editing and also introduced relevant case studies. The author of this paper defined machizukuri in the first volume of the series as follows: "Machizukuri speaks for a series of persistent activities planned to improve the life quality of the town. Based upon the resources of a local community and unifying the various subjectivities in cooperation, town-making activities seek to enliven the town by energizing its communities and bringing forth the charm of the area." Additionally, there are numerous research papers, books, and other materials focused on specific machizukuri actions related to the Mano district machizukuri, which will be introduced later. The book presented to the international community in English by André Sorensen (2007)[30] is also very representative. In it, 13 of the 18 chapters introduce diverse topics presented by Japanese authors. Based on their different results, this paper reconstructs the notion of machizukuri, which has developed rapidly in recent years, from a historical perspective, and reviews its methodology and specific techniques.

Note 2) At the time, the movement did not take any name such as "machizukuri." It simply consisted of interactions with spontaneous starts. We can thus state that machizukuri is not a closed concept; it instead describes a process of finding and designing an adapted methodology for each situation.

Note 3) The Japanese term "*Teikou Undou*" is used to refer to activism, resistance movements, and creative actions.

Note 4) https://www.env.go.jp/en/laws/policy/basic_lp.html

Note 5) In modern Japanese cities, it is not uncommon to find diverse types of organizations. Many of them are derived from traditional autonomous townspeople management groups that have existed since the Edo period, and which reorganized during the modern age. Even though these neighborhood organizations cooperated at the time of World War II, their activities faded temporarily right after the war. However, these groups were quickly resurrected and resumed their activities throughout almost all of Japan in the shape of autonomous organizations that support the daily lives and mutual aid between residents. Today, the majority of households in Japanese traditional residential areas engage in these neighborhood associations.

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Note 6) The district zoning of the "Machizukuri Plan" almost corresponds to the same areas that are serviced by local elementary schools, in other words, the areas of influence surrounding each school.

Note 7) The "Machizukuri Council" ("*Kyogi-kai*") originates from previous forms of community associations, such as "*Chounai-kai*" and "*Jichi-kai*," which had maintained their heavy traditional roles within Japanese communities. Moreover, youth associations, PTAs (parent-teacher associations), and the boards of small industries that were the cause of nuisance in the area are also involved.

Note 8) The official groups and tools were not adopted by all city councils because establishing new ordinances was complicated.

Note 9) Numerous studies exist on machizukuri ordinances. Takamizawa[10] (1999) and Sorensen[11] (2002) are worth a special mention.

Note 10) Local governments in partnership with the Machizukuri Councils would send schematic project proposals for common spaces or facilities to the central government. If selected, the central and local governments would partially fund these projects. When a proposal was selected it would be approved as a public "model project," becoming of "public nature" without the need of a Machizukuri Ordinance. These processes always involved local governments, but at the same time they allowed communities to work without the added difficulty of the creation of the Machizukuri Ordinance.

Note 11) Japanese terms usually bear an additional nuance that can be lost in translation. For example, the kind of ambiguous spatial domain or holistic vision we are discussing here is called "*chiiki un-ei*" (literally "regional management"). "District Management" ("*chiku un-ei*") refers to an administrative scope, "regional management" ("*chiiki un-ei*") entails a wider range, and "community management" ("*komyuniti un-ei*") bears a stronger individual community nuance. Here, we have used the term "area management" to refer to the organizations and people who voluntarily gather in various forms and ranges of machizukuri.

Note 12) The "*machiya*" is a traditional type of Japanese merchant house composed of a shop, living spaces, warehouse, and workplace.

Note 13) At the beginning of the collaborative process, the residents expressed their expectations for the new plan. The maintenance of the unique residential character of the area was set as the main goal. This also included shops and small offices. In addition, the community wanted to make sure that no one would ever be forced to move out of their homes, because whether owner or tenant, each neighbor was considered important. In order to allow all previous residential and retail tenants to remain in the new buildings, a variety of housing types (public housing, subsidized rental housing, and market rate housing) and rental commercial establishments were proposed. Every available financial support, including government funds, was employed to ensure that the new units were affordable. Through this process, each resident and tenant could be assisted in improving their business and living environment in cooperation. Each project was developed by means of a special plan of a smaller scale, designed to integrate the local social and physical contexts. Project by project, these interventions gradually helped to channel the improvement and revitalization of the local community. Soon, by the concatenation of projects, the whole district could be transformed to become a middle-rise area and realize at the same time one of the ideal Architypes that had been established at the beginning of the project: the development of a sustainable heterogeneous living environment.

Note 14) The American Professor Peter Bosselmann from UC Berkeley who had developed and installed similar equipment in advance, greatly advised our team on the development of the device. However, in the case of the Waseda Research Institute of Urban and Regional Studies, in order to simulate a more familiar living environment, it was necessary to combine a micro video camera and a mirror to freely move inside 1/100 models from the position of the human eye. To do so, we independently developed a specific device that could be used by participants during design workshops.

Note 15) Specific terms such as "Scenario Planning," "Scenario Writing," and so forth, are used to refer to such a method. It is used, for example, to examine future implications and specific reactions to business, industry, or environmental problems, among others.

References

1 Shutoken Sougou Keikaku Kenkyujo (ed.), MachiTsukuri Nyumon (Introduction to Machizukuri), Toshi-Jutaku, no.12, Kajima Shuppan Kai, (1975) 1995 (in Japanese).)

2 Watanabe S. Machizukuri in Japan: a historical perspective in participatory community-building initiatives. In: Hein C, Pelletier P, eds. *Cities, Autonomy, and Decentralization in Japan*. London: Routledge; 2006:101-114.

3 Mano Machizukuri Suisin Kai, Mano Chiku Fukkou Kinenshi (ed.) Nihon Saichou Mano Machizukuri (The Longest Machizukuri in Japan, Mano machizukuri Suishin Kai), Kobe, 2005 (in Japanese).

4 Hirohara M. *Machizukuri no Rekishi to Paradaimu no Tenkan* (History of Machizukuri and Paradigm Shift). In Shiraishi K, Tomino T, Hirohara M (eds.), *Gendaino Machizukuri to Chiiki Shakaino Henkaku (Contemporary Machizukuri and Revolution of Local Community)*. Gakugei Shuppansha, Kyoto, 2002 (in Japanese)

5 Kawasumi H. Proofs of 69 years periodicity and imminence of destructive earthquake in southern Kwanto District and problems in the countermeasures thereof. *Journal of Geography (Chigaku Zasshi)*. 1971;**79**:115-138. https://doi.org/10.5026/jgeography.79.3_115.

6 Satoh S (ed.) *Machizukuri no Kagaku (Science of Machizukuri)*. Tokyo: Kashima Shuppannkai; 1999(in Japanese)

7 Watanabe S. Toshi Keikaku vs machizukuri: emerging paradigm of civil society in Japan, 1950–1980. In: Sorensen A, Funck C, eds. *Living Cities in Japan: Citizens' Movements, Machizukuri and Local Environments*. Nissan Institute, Routledge Japanese Studies Series, London, 2007.

8 Igarasi Y. Nisshouken no Riron to Saiban (Theory and Trial of Sunshine Right). Sanseido, 1980 (in Japanese).

9 Itoh T. Toshi oyobi Chiiki Keikan Hozen Seido no Tenkaikatei to Keikanshichou ni kansuru Kenkyu (Research on Development Process of Urban and Regional Landscape Conservation System). Doctoral dissertation, Tokyo University, 1978 (in Japanese).

10 Satoh S; Architectural Institute of Japan (ed.) *Machizukuri no Houhou (Method of Machizukuri)*. Tokyo: Maruzen; 2004(in Japanese).

11 Takamizawa M, Machizukuri Ordinance, Satoh S. (ed.) Machizukuri no Kagaku (Science of Machizukuri), pp. 289-289, 1999 (in Japanese).

12 Sorensen A. *The Making of Urban Japan*. New York, NY: RoutledgeCourzon; 2005.

13 Otsuka H. *Nakacho Atago Chiku no Machizukuri to Jichitai no Torikumi* (Machizukuri in Nakacho Atago District and Local Government's Effort). In: Satoh S, ed. *Sumituzukeru Tameno Shin Machizukuri Shuhou (New Machizukuri Method of Infill Redevelopment Where Everyone can Continue to Live)*. Tokyo: Kajima Shuppankai; 1995(in Japanese).

14 Gregory J, Lewis D, Chang C (eds.) Community Design: By The People, Process: Architecture, no.3, Process Architecture Publishing, 1977.

15 Kinoshita I. Wa-kushoppu (Workshop). Kyoto: Gakugei Shuppan; 2007(in Japanese)

16 Yoshisaka T. Hurenzoku Touitsutai (Dis-Continuous Unity), Toshi-Jutaku, Special Issue *Hakkenn teki Houhou* (Heuristic Method), no. 10-11, August 1975 (in Japanese)

17 Satoh S. A Study of Criterion about Density and Open Space Part1, Part2, AIJ Journal, No. 283, February 1980 and no. 297, November 1980 (in Japanese).

18 Satoh S (ed.) *Sumi Tudukeru Tameno Sin Machizukuri Shuhou (New Machizukuri Method of Infill Redevelopment Where Everyone can Continue to Live)*. Tokyo: Kajima Shuppankai; 1995(in Japanese).

19 Satoh S. Sustainable community improvement in Japan: infill redevelopment where everyone can continue to live. In: Sorensen A, Marcotullio PJ, Grant J, eds. *Towards Sustainable Cities: East Asian, North American and European Perspectives on Managing Urban Regions*. Routledge; 2017. (This book was first published from Ashgate Publishing Company in 2004.)

20 Satoh S (ed.) Machizukuri Shimin-Jigyou (Machizukuri Civil Enterprise). Kyoto: Gakugei Shuppann; 2011.

21 Satoh S, Fujii T, Fujita W, Matsumoto K, Mano Y, Yamamoto H, Ryiu M, Watanabe G. Doujunkai no Jisseki kara Manabu (Learning from Practices of Dojunkai Foundation), Zoukei no.1. Tokyo: Kenchiku Shiryou Kenkyuu Sha; 1996:100-105. (in Japanese)

22 de la Pena D, Allen DJ, Hester TR Jr, Hou J, Lawson LJ, Mcnally MJ, eds. *Design as Democracy: Techniques for Collective Creativity*. Washington: Island Press; 2017.

23 Setagaya Machizukuri Center. Sanka no Dougu bako Part 1, 2, 3, 4 (Toolbox for Participation), Setagaya Machizukuri Center, 1993 (1996) (1998) (2002) (in Japanese).

24 Satoh S, ed. Machizukuri Dezain Ge-mu (Machizukuri Design Game). Kyoto: Gakugei-Shuppan; 2005 (in Japanese).

25 Nakamura A. Machizukuri Heno Sanka no Atarashii Kyokumenn to Sono Dougu Tositeno "Garibah Chizu" (New Aspect of Participation in Town Planning and "Gulliver Map" as its Tool, City Planning Review). Special Issue, Papers on City Planning, vol.38, no.3, 1989, 25 October 2003, pp. 235-240 (in Japanese).

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26 Satoh S. Creating Community Through Machizukuri with the Help of Visual Simulation, Territorio, no.43, Milan, 2008.
27 Kahane A. *Transformative Scenario Planning: Working Together to Change the Future*. San Francisco, CA: Berrett-Koehler Publishers; 2012.
28 Satoh S. Kouiki Hinansha niyoru Takyoju Bunsangata Nettowa-ku Komyunitei no Keisei (Building Network Communities as Multi-habitation by Wide Evacuee After Fukushima Nuclear Plant Accident). Research Institute of Science and Technology for Society in Japan Science and Technology Agency, 2015. https://www.jst.go.jp/ristex/pdf/korei/JST_1115090_12101730_sato_ER.pdf. Accessed February 14, 2019. (in Japanese).
29 Satoh S, ed. Machizukuri kyousho (Textbook of Machizukuri). Tokyo: Kashima Shuppan-kai; 2017. (in Japanese)
30 Sorensen A, Funck C, eds. Living Cities in Japan. Nissan Institute, Routledge Japanese Studies Series, 2007.
31 Nojima S. *ShinMachiya no Machinami to Jukankyouzukuri*. In: Sato S, ed. *Sumi tudukeru tameno sin-machizukuri shuhou (New Machizukuri Method of Infill Redevelopment Where Everyone can Continue to Live)*. Tokyo: Kajima Shuppankai; 1995:152-158. (in Japanese)

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